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(54) **Method for manufacturing a foil laminate with a defined curvature and foil laminate obtained therewith**

Verfahren zum Herstellen eines Laminats mit einer bestimmten Krümmung und so hergestelltes Laminat

Procédé pour fabriquer un laminé avec une courbure prédéterminée et laminé ainsi fabriqué

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- **PATENT ABSTRACTS OF JAPAN vol. 014, no. 450 (M-1030), 27 September 1990 & JP 02 179739 A (NIPPON KINZOKU KOGYO KK), 12 July 1990,**

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Description

[0001] It is an object of the invention to provide a method which offers the possibility of manufacturing a foil laminate which has a defined curvature in the free state.

[0002] In respect of this objective the invention provides a method for manufacturing a foil laminate with a defined curvature, which method comprises the following steps of:

providing an encapsulating device comprising:

transporting means for carrying a carrier foil through the device;
first supply means for supplying to the carrier foil a first skin laminate such that the glue layer forming part thereof is brought into contact with the first surface of the carrier foil;
second supply means for supplying to the other side of the carrier foil a second skin laminate such that the glue layer forming part thereof is brought into contact with the second surface of the carrier foil; and
pressing means comprising a pinch for exerting a pressure force on the stack passing through and consisting of the first skin laminate, the carrier foil and the second skin laminate; and

controlling the first and the second supply means such that the first and the second skin laminates are each introduced into said pinch at a chosen tensile stress such that the skin laminates of the resulting laminate leaving the pinch which are mutually adhered via the carrier foil have respective tensions and in the free state the laminate has a curvature corresponding therewith.

[0003] A specific embodiment of the method according to the invention aims at manufacturing a foil which is to a great extent form-retaining and has a total resulting curvature in free state with a value of zero.

[0004] In this respect the invention provides a method in which the said tensile stresses are equal and the resulting free laminate is flat.

[0005] A foil laminate manufactured with the method according to the invention has a curvature which is to a large degree constant.

[0006] A specific embodiment has the special feature that the first skin laminate has on its side remote from the glue layer a layer at least more or less repelling adhesion, for instance a layer of PTFE or a film of silicone material, and the second laminate has on its side remote from the glue layer a second glue layer, in particular a pressure-sensitive glue layer. A foil laminate obtained herewith has the advantage that when rolled up the second glue layer is unable or is at least to only a small extent able to adhere to the adhesion repelling layer consisting of PTFE or the film of silicone material. In order to prevent spontaneous unwinding of foil laminate from a supply roll it is however recommended to ensure that the relevant layers do mutually adhere at least to a slight extent.

[0007] Another embodiment has the special feature that the second laminate has on its side remote from the glue layer a second glue layer, in particular a thermally-activated glue layer.

[0008] For the same reasons as specified above in respect of a pressure-sensitive glue layer, the variant is recommended in the case of the latter described embodiment in which at least the outer surface of the second layer is to a slight extent pressure-sensitive. Also in this case the outer layers of a rolled-up foil laminate lying over each other adhere mutually to a slight extent, whereby spontaneous unwinding of the foil laminate from a supply roll is prevented.

[0009] The relevant glue layers are generally known. A pressure-sensitive glue layer can consist of acryl material. For very limited pressure-sensitive layers and layers of pressure-sensitive type adhering to a small extent a very thin layer of acryl material can be used. EVA for instance can be considered suitable as thermally activated adhesive. Attention is drawn to the fact that the said materials are mentioned only by way of example and not as limitation.

[0010] A particular embodiment has the special feature that the carrier foil consists of aluminium of a thickness of 5-25 μm. Aluminium has the property of being non-transparent. In the case where a light-transmitting foil laminate is desired other materials are more suitable.

[0011] Use can also be made of a light-transmitting carrier foil and a non-transparent layer in one of the two skin laminates or in both skin laminates.

[0012] The stiffness and therewith the stability of the form of a resulting foil laminate can be improved by a method according to which the skin laminates each comprise a tensively strong layer.

[0013] This latter variant can be embodied such that the tensively strong layer consists of polyester/PET with a thickness of 25-250 μm.

[0014] Finally, the invention also relates to a foil laminate obtained with any of the methods according to the invention. Such a foil laminate comprises at least a carrier foil and a skin laminate adhered thereto under bias on both sides and at least comprising a glue layer and a plastic layer of a suitable chosen material.

Claims

1. Method for manufacturing a foil laminate with a defined curvature, which method comprises the following steps of:

providing an encapsulating device comprising:

transporting means for carrying a carrier foil through the device;
first supply means for supplying to the carrier foil a first skin laminate such that the glue layer forming part thereof is brought into contact with the first surface of the carrier foil;
second supply means for supplying to the other side of the carrier foil a second skin laminate such that the glue layer forming part thereof is brought into contact with the second surface of the carrier foil; and
pressing means comprising a pinch for exerting a pressure force on the stack passing through and consisting of the first skin laminate, the carrier foil and the second skin laminate; and

controlling the first and the second supply means such that the first and the second skin laminates are each introduced into said pinch at a chosen tensile stress such that the skin laminates of the resulting laminate leaving the pinch which are mutually adhered via the carrier foil have respective tensions and in the free state the laminate has a curvature corresponding therewith.

2. Method as claimed in claim 1, wherein the said tensile stresses are equal and the resulting free laminate is flat.

3. Method as claimed in claim 1, wherein the first skin laminate has on its side remote from the glue layer a layer at least more or less repelling adhesion, for instance a layer of PTFE or a film of silicone material, and the second laminate has on its side remote from the glue layer a second glue layer, in particular a pressure-sensitive glue layer.

4. Method as claimed in claim 1, wherein the second laminate has on its side remote from the glue layer a second glue layer, in particular a thermally-activated glue layer.

5. Method as claimed in claim 4, wherein at least the outer surface of the second layer is to a slight extent pressure-sensitive.

6. Method as claimed in claim 1, wherein the carrier foil consists of aluminium of a thickness of 5-25 μm.

7. Method as claimed in claim 1, wherein the skin laminates each comprise a tensively strong layer.

8. Method as claimed in claim 7, wherein the tensively strong layer consists of polyester/PET with a thickness of 25-250 μm.

Patentansprüche

1. Verfahren zum Herstellen eines Folienlaminats mit einer definierten Krümmung, wobei das Verfahren die folgenden Schritte umfasst:

Bereitstellen einer Kapselungsvorrichtung, die umfasst:

Fördermittel zum Transportieren einer Trägerfolie durch die Vorrichtung;

erste Zufuhrmittel zum Zuführen eines ersten Hautlaminats zur Trägerfolie, so dass die einen Teil davon bildende Klebstoffschicht in Kontakt mit der ersten Oberfläche der Trägerfolie gebracht wird;

zweite Zufuhrmittel zum Zuführen eines zweiten Hautlaminats zur anderen Seite der Trägerfolie, so dass die einen Teil davon bildende Klebstoffschicht in Kontakt mit der zweiten Oberfläche der Trägerfolie gebracht wird; und

Pressmittel, die eine Quetschung zum Ausüben einer Presskraft auf den durchlaufenden und aus dem ersten Hautlaminat, der Trägerfolie und dem zweiten Hauptlaminat bestehenden Stapel umfasst; und

Steuern der ersten und zweiten Zufuhrmittel, so dass sowohl das erste als auch das zweite Hautlaminat so mit einer gewählten Zugspannung in die Quetschung eingeführt werden, dass die Hautlaminate des sich ergebenden Laminats, welche die Quetschung verlassen, die mittels der Trägerfolie aneinander angeheftet sind, jeweils Spannung aufweisen und das Laminat im freien Zustand eine dementsprechende Krümmung aufweist.

2. Verfahren gemäß Anspruch 1, wobei die Zugspannungen gleich sind und das sich ergebende freie Laminat flach ist.

3. Verfahren gemäß Anspruch 1, wobei das erste Hautlaminat auf seiner von der Klebstoffschicht abgewandten Seite eine Schicht aufweist, die zumindest mehr oder weniger Anhaftung abweist, beispielsweise eine Schicht aus PTFE oder einem Film aus Silikonmaterial, und das zweite Laminat auf seiner von der Klebstoffschicht abgewandten Seite eine zweite Klebstoffschicht, insbesondere eine drucksensitive Klebstoffschicht, aufweist.

4. Verfahren gemäß Anspruch 1, wobei das zweite Laminat auf seiner von der Klebstoffschicht abgewandten Seite eine zweite Klebstoffschicht aufweist, insbesondere eine thermisch aktivierte Klebstoffschicht.

5. Verfahren gemäß Anspruch 4, wobei zumindest die äußere Oberfläche der zweiten Schicht in geringem Ausmaß drucksensitiv ist.

6. Verfahren gemäß Anspruch 1, wobei die Trägerfolie aus Aluminium einer Dicke von 5-25 µm besteht.

7. Verfahren gemäß Anspruch 1, wobei alle Hautlaminate eine spannungsverursachende starke Schicht umfassen.

8. Verfahren gemäß Anspruch 7, wobei die spannungsverursachende starke Schicht aus Polyester/PET mit einer Dicke von 25-250 µm besteht.

Revendications

1. Procédé pour fabriquer un panneau plaqué avec une courbure définie, lequel procédé comporte les étapes suivantes :

   proposer un dispositif d'encapsulation comprenant :

   un moyen de transport pour transporter un panneau de support à travers le dispositif ;
   un premier moyen d'approvisionnement pour fournir au panneau de support une première feuille de stratifié de sorte que la couche de colle faisant partie de cette dernière soit portée au contact de la première surface du panneau de support ;
   un second moyen d'approvisionnement pour fournir à l'autre côté du panneau porteur une seconde feuille de stratifié de sorte que la couche de colle faisant partie de cette dernière soit portée au contact de la seconde surface du panneau de support ; et
   un moyen de pressage comprenant un dispositif à striction pour exercer une force de pression sur l'empilage passant à travers et constitué de la première feuille de stratifié, du panneau de support et de la seconde feuille de stratifié ; et

   commander les premier et second moyens d'approvisionnement de sorte que les première et seconde feuilles stratifiées soient chacune introduites dans ledit dispositif à striction avec une contrainte de tension définie, de sorte que les feuilles stratifiées du stratifié résultant quittant le dispositif à striction, qui sont collées ensemble via le panneau de support, ont des tensions respectives, et de sorte qu'à l'état libre le stratifié a une courbure correspondante.

2. Procédé selon la revendication 1, dans lequel lesdites contraintes de tension sont égales et dans lequel le stratifié libre résultant est plat.

3. Procédé selon la revendication 1, dans lequel la première feuille de stratifié a, sur son côté opposé à la couche de colle, une couche repoussant au moins plus ou moins l'adhérence, par exemple une couche de PTFE ou un film de matière silicone, et le second stratifié a, sur son côté opposé à la couche de colle, une seconde couche de colle, en particulier une couche de colle sensible à la pression.

4. Procédé selon la revendication 1, dans lequel le second stratifié a, sur son côté opposé à la couche de colle, une seconde couche de colle, en particulier une couche de colle activée thermiquement.

5. Procédé selon la revendication 4, dans lequel au moins la surface extérieure de la seconde couche est jusqu'à un degré modéré sensible à la pression.

6. Procédé selon la revendication 1, dans lequel le panneau de support se compose d'aluminium d'une épaisseur de 5 à 25 µm.

7. Procédé selon la revendication 1, dans lequel chacune des feuilles de stratifié comporte une couche sous forte tension.

8. Procédé selon la revendication 7, dans lequel la couche sous forte tension se compose de polyester / PET avec une épaisseur de 25 à 250 µm.